Exhibit 1

ITUPublications
Recommendations
International Telecommunication Union
Standardization Sector

Recommendation

ITU-T H.264 (V15) (08/2024)

SERIES H: Audiovisual and multimedia systems

Infrastructure of audiovisual services – Coding of moving video

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Advanced video coding for generic audiovisual services

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Audiovisual and multimedia systems

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For further details, please refer to the list of ITU-T Recommendations.

- Recommendation ITU-T H.274: in force | ISO/IEC 23002-7: in force, *Versatile supplemental enhancement information messages for coded video bitstreams*.
- Recommendation ITU-T T.35 (2000), *Procedure for the allocation of ITU-T defined codes for non-standard facilities*.
- ISO/IEC 11578:1996, *Information technology – Open Systems Interconnection – Remote Procedure Call (RPC)*.
- ISO 11664-1:2007, *Colorimetry – Part 1: CIE standard colorimetric observers*.
- ISO 12232:2006, *Photography – Digital still cameras – Determination of exposure index, ISO speed ratings, standard output sensitivity, and recommended exposure index*.
- ISO/IEC 23001-11, *Information Technology – MPEG Systems Technologies – Part 11: Energy-efficient media consumption (Green metadata)*.

For the additional normative reference that applies for the scalability information SEI message specified in Annex F, see clause F.2.

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply:

3.1 **access unit**: A set of *NAL units* that are consecutive in *decoding order* and contain exactly one *primary coded picture*. In addition to the *primary coded picture*, an access unit may also contain one or more *redundant coded pictures*, one *auxiliary coded picture*, or other *NAL units* not containing *slices* or *slice data partitions* of a *coded picture*. The decoding of an access unit always results in a *decoded picture*.

3.2 **AC transform coefficient**: Any *transform coefficient* for which the *frequency index* in one or both dimensions is non-zero.

3.3 **adaptive binary arithmetic decoding process**: An entropy *decoding process* that derives the values of *bins* from a *bitstream* produced by an *adaptive binary arithmetic encoding process*.

3.4 **adaptive binary arithmetic encoding process**: An entropy *encoding process*, not normatively specified in this Recommendation | International Standard, that codes a sequence of *bins* and produces a *bitstream* that can be decoded using the *adaptive binary arithmetic decoding process*.

3.5 **alpha blending**: A process not specified by this Recommendation | International Standard, in which an *auxiliary coded picture* is used in combination with a *primary coded picture* and with other data not specified by this Recommendation | International Standard in the *display process*. In an alpha blending process, the samples of an *auxiliary coded picture* are interpreted as indications of the degree of opacity (or, equivalently, the degrees of transparency) associated with the corresponding *luma* samples of the *primary coded picture*.

3.6 **arbitrary slice order (ASO)**: A *decoding order* of *slices* in which the *macroblock address* of the first *macroblock* of some *slice* of a *slice group* may be less than the *macroblock address* of the first *macroblock* of some other preceding *slice* of the same *slice group* or, in the case of a *picture* that is coded using three separate colour planes, some other preceding *slice* of the same *slice group* within the same colour plane, or in which the *slices* of a *slice group* of a picture may be interleaved with the *slices* of one or more other *slice groups* of the *picture* or, in the case of a *picture* that is coded using three separate colour planes, with the *slices* of one or more other *slice groups* within the same colour plane.

3.7 **auxiliary coded picture**: A *picture* that supplements the *primary coded picture* that may be used in combination with other data not specified by this Recommendation | International Standard in the *display process*. An auxiliary coded picture has the same syntactic and semantic restrictions as a monochrome *redundant coded picture*. An auxiliary coded picture must contain the same number of *macroblocks* as the *primary coded picture*. Auxiliary coded pictures have no normative effect on the *decoding process*. See also *primary coded picture* and *redundant coded picture*.

3.8 **azimuth circle**: circle on a sphere connecting all points with the same azimuth value.

NOTE – An azimuth circle is always a *great circle* like a longitude line on the earth.

3.9 **B slice**: A *slice* that may be decoded using *intra prediction* or *inter prediction* using at most two *motion vectors* and *reference indices* to *predict* the sample values of each *block*.

3.10 **bin**: One bit of a *bin string*.

3.11 **binarization**: A set of *bin strings* for all possible values of a *syntax element*.

3.12 **binarization process**: A unique mapping process of all possible values of a *syntax element* onto a set of *bin strings*.

3.13 **bin string**: A string of *bins*. A bin string is an intermediate binary representation of values of *syntax elements* from the *binarization* of the *syntax element*.

3.14 **bi-predictive slice**: See *B slice*.

3.15 **bitstream**: A sequence of bits that forms the representation of *coded pictures* and associated data forming one or more *coded video sequences*. Bitstream is a collective term used to refer either to a *NAL unit stream* or a *byte stream*.

3.16 **block**: An MxN (M-column by N-row) array of samples, or an MxN array of *transform coefficients*.

3.17 **bottom field**: One of two *fields* that comprise a *frame*. Each row of a *bottom field* is spatially located immediately below a corresponding row of a *top field*.

3.18 **bottom macroblock (of a macroblock pair)**: The *macroblock* within a *macroblock pair* that contains the samples in the bottom row of samples for the *macroblock pair*. For a *field macroblock pair*, the bottom macroblock represents the samples from the region of the *bottom field* of the *frame* that lie within the spatial region of the *macroblock pair*. For a *frame macroblock pair*, the bottom macroblock represents the samples of the *frame* that lie within the bottom half of the spatial region of the *macroblock pair*.

3.19 **broken link**: A location in a *bitstream* at which it is indicated that some subsequent *pictures* in *decoding order* may contain serious visual artefacts due to unspecified operations performed in the generation of the *bitstream*.

3.20 **byte**: A sequence of 8 bits, written and read with the most significant bit on the left and the least significant bit on the right. When represented in a sequence of data bits, the most significant bit of a byte is first.

3.21 **byte-aligned**: A position in a *bitstream* is byte-aligned when the position is an integer multiple of 8 bits from the position of the first bit in the *bitstream*. A bit or *byte* or *syntax element* is said to be byte-aligned when the position at which it appears in a *bitstream* is byte-aligned.

3.22 **byte stream**: An encapsulation of a *NAL unit stream* containing *start code prefixes* and *NAL units* as specified in Annex B.

3.23 **can**: A term used to refer to behaviour that is allowed, but not necessarily required.

3.24 **category**: A number associated with each *syntax element*. The category is used to specify the allocation of *syntax elements* to *NAL units* for *slice data partitioning*. It may also be used in a manner determined by the application to refer to classes of *syntax elements* in a manner not specified in this Recommendation | International Standard.

3.25 **chroma**: An adjective specifying that a sample array or single sample is representing one of the two colour difference signals related to the primary colours. The symbols used for a chroma array or sample are Cb and Cr.

NOTE – The term chroma is used rather than the term chrominance in order to avoid the implication of the use of linear light transfer characteristics that is often associated with the term chrominance.

3.26 **coded field**: A *coded representation* of a *field*.

3.27 **coded frame**: A *coded representation* of a *frame*.

3.28 **coded picture**: A *coded representation* of a *picture*. A coded picture may be either a *coded field* or a *coded frame*. Coded picture is a collective term referring to a *primary coded picture* or a *redundant coded picture*, but not to both together.

3.29 **coded picture buffer (CPB)**: A first-in first-out buffer containing *access units* in *decoding order* specified in the *hypothetical reference decoder* in Annex C.

3.30 **coded representation**: A data element as represented in its coded form.

3.31 **coded slice data partition NAL unit**: A *NAL unit* containing a *slice data partition*.

3.32 **coded slice NAL unit**: A *NAL unit* containing a *slice* that is not a *slice* of an *auxiliary coded picture*.

3.33 **coded video sequence**: A sequence of *access units* that consists, in decoding order, of an *IDR access unit* followed by zero or more non-IDR *access units* including all subsequent *access units* up to but not including any subsequent *IDR access unit*.

3.34 **component**: An array or single sample from one of the three arrays (*luma* and two *chroma*) that make up a *field* or *frame* in 4:2:0, 4:2:2, or 4:4:4 colour format or the array or a single sample of the array that make up a *field* or *frame* in monochrome format.

3.35 **complementary field pair:** A collective term for a *complementary reference field pair* or a *complementary non-reference field pair*.

3.36 **complementary non-reference field pair**: Two *non-reference fields* that are in consecutive *access units* in *decoding order* as two *coded fields* of opposite parity and share the same value of the frame_num *syntax element*, where the first *field* is not already a paired *field.*

3.37 **complementary reference field pair**: Two *reference fields* that are in consecutive *access units* in *decoding order* as two *coded fields* and share the same value of the frame_num *syntax element*, where the second *field* in *decoding order* is not an *IDR picture* and does not include a memory_management_control_operation *syntax element* equal to 5.

3.38 **constituent picture**: part of a spatially frame-packed stereoscopic video picture that corresponds to one view, or a picture itself when frame packing is not in use or the temporal interleaving frame packing arrangement is in use.

3.39 **context variable**: A variable specified for the *adaptive binary arithmetic decoding process* of a *bin* by an equation containing recently decoded *bins*.

3.40 **DC transform coefficient**: A *transform coefficient* for which the *frequency index* is zero in all dimensions.

3.41 **decoded picture**: A *decoded picture* is derived by decoding a *coded picture*. A *decoded picture* is either a decoded *frame*, or a decoded *field*. A decoded *field* is either a decoded *top field* or a decoded *bottom field*.

3.42 **decoded picture buffer (DPB)**: A buffer holding *decoded pictures* for reference, output reordering, or output delay specified for the *hypothetical reference decoder* in Annex C.

3.43 **decoder**: An embodiment of a *decoding process*.

3.44 **decoder under test (DUT)**: A *decoder* that is tested for conformance to this Recommendation | International Standard by operating the *hypothetical stream scheduler* to deliver a conforming *bitstream* to the *decoder* and to the *hypothetical reference decoder* and comparing the values and timing of the output of the two *decoders*.

3.45 **decoding order**: The order in which *syntax elements* are processed by the *decoding process*.

3.46 **decoding process**: The process specified in this Recommendation | International Standard that reads a *bitstream* and derives *decoded pictures* from it.

3.47 **direct prediction**: An *inter prediction* for a *block* for which no *motion vector* is decoded. Two direct *prediction* modes are specified that are referred to as spatial direct *prediction* and temporal *prediction* mode.

3.48 **display process**: A process not specified in this Recommendation | International Standard having, as its input, the cropped decoded *pictures* that are the output of the *decoding process.*

3.49 **elevation circle**: circle on a sphere connecting all points with the same elevation value.

NOTE – An elevation circle is similar to a lattitude line on the earth. Except when the elevation value is zero, an elevation circle is not a *great circle* like a longitude circle on the earth.

3.50 **emulation prevention byte**: A *byte* equal to 0x03 that may be present within a *NAL unit*. The presence of emulation prevention bytes ensures that no sequence of consecutive *byte-aligned bytes* in the *NAL unit* contains a *start code prefix*.

3.51 **encoder**: An embodiment of an *encoding process*.

3.52 **encoding process**: A process, not specified in this Recommendation | International Standard, that produces a *bitstream* conforming to this Recommendation | International Standard.

3.53 **field**: An assembly of alternate rows of a *frame*. A *frame* is composed of two *fields*, a *top field* and a *bottom field*.

3.54 **field macroblock**: A *macroblock* containing samples from a single *field*. All *macroblocks* of a *coded field* are field macroblocks. When *macroblock-adaptive frame/field decoding* is in use, some *macroblocks* of a *coded frame* may be field macroblocks.

3.55 **field macroblock pair**: A *macroblock pair* decoded as two *field macroblocks.*

3.56 **field scan**: A specific sequential ordering of *transform coefficients* that differs from the *zig-zag scan* by scanning columns more rapidly than rows. Field scan is used for *transform coefficients* in *field macroblocks.*